

Appl. No. : 10/606,982 Confirmation No. 6440
Applicants : Lewis, Michael
Filed : 06/26/2003
TC/A.U.: 3764
Examiner : Derrille, Danton
Docket No. : 244.002
Customer No. : 9809
Response of 12/2/2005 to Office Action of September 6, 2005

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

CLAIMS

1. (Currently Amended) A cuff for use in counterpulsation treatment of a patient wherein pressure is applied to and released from a patient's blood vessels to stimulate blood flow correlated with a ~~patient's~~ user's physiological ~~rhythms~~ data based on data received from at least one physiological measuring device, comprising:
 - a. a cuff ~~to be received on a patient~~, said cuff having a first edge, a second edge, a third edge, a fourth edge, a top side and a bottom side, said cuff sized to fully encircle a body part of said patient ~~user~~ such that said bottom side contacts said ~~patient~~ user peripherally;
 - b. said cuff having at least one electromechanical actuator integral to said cuff, said actuator being ~~adjacent~~ proximate said first edge and fixedly attached to said top side, said actuator being rigidly attached to an actuator extension, said actuator extension being attached to a tension attachment, said actuator being distant from said tension attachment, said tension attachment being rigidly attached to said cuff at said top side ~~adjacent~~ proximate said second edge; said actuator being controllably operable to a plurality of positions;

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- c. said plurality of positions being within a range of positions;
 - d. said range of positions ranging from an original position to a maximum constricted position;
 - e. said distance between said electromechanical actuator and said tension attachment in said original position being greater than said distance in said constricted position;
 - f. said cuff applying maximum positive pressure to said ~~patient's~~ user's blood vessels to constrict said blood vessels in said maximum constricted position of said plurality of positions of said actuator;
 - ~~g. said cuff applying no pressure to said patient's user's blood vessels to constrict said blood vessels in said original position of said plurality of positions of said actuator;~~
 - h. g. said distance directly related to each position of said electromechanical actuator unit in said range of positions; and
 - i. said electromechanical actuator unit controllably operable from said relaxed position to any of said positions within said range of positions; and
 - j. said electromechanical actuator unit operable at variable frequency, at least one said frequency responsive to at least one said physiological datum.
2. (Original) The cuff as described in Claim 1 wherein said cuff is rectangular or trapezoidal in shape to accommodate increasing or decreasing thickness of ~~patient~~ user extremities.

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3. (Original) The cuff as described in Claim 1 wherein said cuff further comprises a flexible bladder contiguous to said bottom side.
4. (Original) The device as in Claim 3, wherein each said actuator unit and each said extension attachment has a force distribution footing.
5. (Currently Amended) The device as in Claim 3, wherein:
said cuff further comprises a flexible surface layer;
said flexible surface layer is decreased in thickness at a stepped point along an entire width of one end forming an overlap section which continues until the surface layer becomes a tapered point; and
wherein the entire width of an opposite end of said flexible surface layer defines an abrupt taper upward from a point beyond a contact with the said flexible bladder section.
6. (Currently Amended) The device as in Claim 3, wherein:
said cuff further comprises a flexible surface layer and a flexible liner layer;
said flexible bladder is intermediate said flexible surface layer and said flexible liner layer; and
wherein a the sum thickness of the said flexible surface layer, said flexible bladder section, and said flexible liner layer is between 0.1 and 3.0 inches at the thickest point.
7. (Original) The device as in Claim 3, wherein a cuff width is in the range of 1.0 and 20.0 inches.
8. (Original) The device as in Claim 3, wherein length of the cuff is in the range of 4.0 and 40.0 inches.

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9. (Currently Amended) The device as in Claim 3, wherein said cuff further comprises a flexible liner layer, wherein a diameter of an affixed actuator cuff as measured from said flexible liner layer is in the range of 1.0 and 12.0 inches.
10. (Currently Amended) The device as in Claim 3 wherein the said flexible bladder section further comprises a plurality of bladder subsections with a plurality empty cavities between each said subsection.
11. (Original) The device as in Claim 1 wherein said cuff contains a pressure sensor.
12. (Previously Withdrawn)
13. (Previously Withdrawn)
14. (Previously Withdrawn)
15. (Previously Withdrawn)
16. (Previously Withdrawn)
17. (Previously Withdrawn)
18. (Previously Withdrawn)
19. (Previously Withdrawn)
20. (Previously Withdrawn)
21. (Previously Withdrawn)
22. (Previously Withdrawn)
23. (Currently Amended) A method of treating a medical condition using pulsation comprising the steps of:
 - a. applying a cuff to a patient,

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said cuff having a first edge, a second edge, ~~the~~ a third edge, a fourth edge, a top side and a bottom side, said cuff sized to fully encircle a body part of said patient such that said bottom side contacts said patient peripherally;

said cuff having at least one electromechanical actuator integral to said cuff, said actuator being adjacent first edge and fixedly attached to said top side, said actuator being rigidly attached to an actuator extension, said actuator extension being attached to a tension attachment, said actuator being distant from said tension attachment, said tension attachment being rigidly attached to said cuff at said top side adjacent said second edge; said actuator being controllably operable to a plurality of positions; said plurality of positions being within a range of positions;

said range of positions ranging from an original position to a maximum constricted position;

said distance between said electromechanical actuator and said tension attachment in said original position being greater than said distance in said constricted position;

said cuff applying maximum positive pressure to said patient's blood vessels to constrict said blood vessels in said maximum constricted position of said plurality of positions of said actuator;

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~~said cuff applying no pressure to said patient's blood vessels to constrict said blood vessels in said original position of said plurality of positions of said actuator;~~

said distance directly related to each position of said electromechanical actuator unit in said range of positions;

said electromechanical actuator unit controllably operable from said relaxed position to any of said positions within said range of positions on activation;

said cuff having an internal bladder which may be inflated to a desired volume to expand thickness of said cuff;

said bladder communicating with an external source of inflating liquid;

said bladder having a pressure relief valve;

said cuff having a pressure sensor for communicating with an external processor.

- b. applying medical devices to said patient to detect physiological data;
- c. detecting physiological data from said patient through use of said medical devices;
- d. transmitting said physiological data electronically from said medical devices to a processor;
- e. detecting said pressure data in said bladder;
- f. transmitting said pressure data from said pressure sensor to a pressure data processor;

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- g. electronically processing said pressure data to determine and effect optimal pressure in said cuff;
 - h. inflating said bladder until desired pressure is obtained;
 - i. electronically processing said physiological data to determine when the patient's heart is in a diastolic or a systolic phase;
 - j. electronically timing said activation of each electromechanical cuff to correlate with the phases of the patient's heart;
 - l. modifying said pressure according to changes in said physiological data affected by said activation; and
 - k. modifying said timing of said activation of said plurality of electromechanical cuffs according to changes in said physiological data affected by said activation.
24. (Original) The device in Claim 1 wherein said pulsation comprises counterpulsation.
25. (Original) The device in Claim 1 wherein said pulsation comprises simultaneous pulsation.
26. (Original) The device in Claim 10 wherein said pulsation comprises counterpulsation.
27. (Original) The device in Claim 10 wherein said pulsation comprises simultaneous pulsation.
28. (Withdrawn)
29. (Withdrawn)

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30. (Currently Amended) The device in Claim ~~25~~ 23 wherein said pulsation comprises
counterpulsation.
31. (Currently Amended) The device in Claim ~~25~~ 23 wherein said pulsation comprises
simultaneous pulsation.